Math 211
Quiz 15

F 26 Jul 2019

Your name : _____

Exercise

(5 pt) Solve the initial value problem given by the homogeneous 2nd-order ODE

$$y'' + 6y' + 8y = 0 \tag{1}$$

and the initial conditions

$$y(0) = 3, \qquad y'(0) = -10.$$

Your final answer should be an explicit equation for $y(t)$.[1]

[1] *Hint:* We have two approaches to find the general solution $y(t)$ to (1): (1) translate the given higher-order linear ODE into the corresponding 1st-order linear system (what do the initial conditions become in this case?), and (2) jump directly to the characteristic equation. The general solution involves two parameters, call them c_1, c_2. Compute $y(t)$, take its derivative to get $y'(t)$ (which will also involve c_1, c_2), then apply the initial conditions to get a system of two linear equations in the two unknowns c_1, c_2. Now solve this system, e.g., using our techniques from linear algebra.